

**Notice of Allowability**

Application No.

09/977,254

Applicant(s)

OZIN ET AL.

Examiner

Alicia Chevalier

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address--

All claims being allowable, PROSECUTION ON THE MERITS IS (OR REMAINS) CLOSED in this application. If not included herewith (or previously mailed), a Notice of Allowance (PTOL-85) or other appropriate communication will be mailed in due course. **THIS NOTICE OF ALLOWABILITY IS NOT A GRANT OF PATENT RIGHTS.** This application is subject to withdrawal from issue at the initiative of the Office or upon petition by the applicant. See 37 CFR 1.313 and MPEP 1308.

1. ☒ This communication is responsive to 5/23/05.
2. ☒ The allowed claim(s) is/are 1-16, 87-92, 94-98 and 102-104.
3. ☒ The drawings filed on 16 October 2001 and 25 August 2005 are accepted by the Examiner.
4. ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
  - a) ☐ All    b) ☐ Some\*    c) ☐ None    of the:
    1. ☐ Certified copies of the priority documents have been received.
    2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
    3. ☐ Copies of the certified copies of the priority documents have been received in this national stage application from the International Bureau (PCT Rule 17.2(a)).

\* Certified copies not received: \_\_\_\_\_.

Applicant has THREE MONTHS FROM THE "MAILING DATE" of this communication to file a reply complying with the requirements noted below. Failure to timely comply will result in ABANDONMENT of this application.  
**THIS THREE-MONTH PERIOD IS NOT EXTENDABLE.**

5. ☐ A SUBSTITUTE OATH OR DECLARATION must be submitted. Note the attached EXAMINER'S AMENDMENT or NOTICE OF INFORMAL PATENT APPLICATION (PTO-152) which gives reason(s) why the oath or declaration is deficient.
  6. ☐ CORRECTED DRAWINGS (as "replacement sheets") must be submitted.
    - (a) ☐ including changes required by the Notice of Draftsperson's Patent Drawing Review (PTO-948) attached
      - 1) ☐ hereto or 2) ☐ to Paper No./Mail Date \_\_\_\_\_.
    - (b) ☐ including changes required by the attached Examiner's Amendment / Comment or in the Office action of Paper No./Mail Date \_\_\_\_\_.
- Identifying indicia such as the application number (see 37 CFR 1.84(c)) should be written on the drawings in the front (not the back) of each sheet. Replacement sheet(s) should be labeled as such in the header according to 37 CFR 1.121(d).
7. ☐ DEPOSIT OF and/or INFORMATION about the deposit of BIOLOGICAL MATERIAL must be submitted. Note the attached Examiner's comment regarding REQUIREMENT FOR THE DEPOSIT OF BIOLOGICAL MATERIAL.

**Attachment(s)**

- |   |   |
|---|---|
| 1. <input type="checkbox"/> Notice of References Cited (PTO-892)  | 5. <input type="checkbox"/> Notice of Informal Patent Application (PTO-152)           |
| 2. <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)                                | 6. <input type="checkbox"/> Interview Summary (PTO-413),<br>Paper No./Mail Date _____ |
| 3. <input type="checkbox"/> Information Disclosure Statements (PTO-1449 or PTO/SB/08),<br>Paper No./Mail Date _____ | 7. <input type="checkbox"/> Examiner's Amendment/Comment                              |
| 4. <input type="checkbox"/> Examiner's Comment Regarding Requirement for Deposit<br>of Biological Material          | 8. <input checked="" type="checkbox"/> Examiner's Statement of Reasons for Allowance  |
|   | 9. <input type="checkbox"/> Other _____   |

***REASONS FOR ALLOWANCE***

1. The following is an examiner's statement of reasons for allowance:

The base claim(s) is/are: 1, 87, 88, 89, 91, 92 and 96.

The present claims are deemed allowable over the references since the prior art fails to disclose or render obvious a composite material comprising a substrate having a surface relief formed of surface features on a surface of the substrate including any of closed indentations, closed channels and open and continuous channels of selected size and shape, and a well ordered colloidal photonic crystal formed of colloidal particles of selected size and shape self-assembled within each of the surface features in the surface relief pattern, and each colloidal photonic crystal exhibiting optical Bragg diffraction (claims 1, 87, 88, 89, 91 and 92) or a bi-frequency colloidal crystal diffraction device, comprising a substrate and a first array of first colloidal particles of a first size arrayed in elongate, parallel and spaced first strips across a top surface of the substrate forming first colloidal photonic crystals in each of the first strips, and a second array of second colloidal particles of a second size arrayed in elongate, parallel and spaced second strips across the top surface of the substrate with each second strip of the second array being located between two adjacent first strips of the first strips of the first array forming second colloidal photonic crystals in each of the second strips, and wherein the first size is different from the second size, and wherein the first and second colloidal photonic crystals exhibit optical Bragg diffraction.

While Patel et al. (U.S. Patent No. 6,436,187 B1) and Clark et al. (U.S. Patent No. 4,728,591) disclose composite material comprising a substrate that includes indentations wherein a single colloidal crystal is formed by self-assembly in the indentations, Patel and Clark fail to

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disclose a well ordered colloidal photonic crystal formed of colloidal particles of selected size and shape self-assembled within each of the surface features in the surface relief pattern, and each colloidal photonic crystal exhibiting optical Bragg diffraction or a first array of first colloidal particles of a first size arrayed in elongate, parallel and spaced first strips across a top surface of the substrate forming first colloidal photonic crystals in each of the first strips, and a second array of second colloidal particles of a second size arrayed in elongate, parallel and spaced second strips across the top surface of the substrate with each second strip of the second array being located between two adjacent first strips of the first strips of the first array forming second colloidal photonic crystals in each of the second strips, and wherein the first size is different from the second size, and wherein the first and second colloidal photonic crystals exhibit optical Bragg diffraction.

In sum, the prior art of record fails to teach or suggest composite material having all the features of the base claim(s).

2. Any comments considered necessary by applicant must be submitted no later than the payment of the issue fee and, to avoid processing delays, should preferably accompany the issue fee. Such submissions should be clearly labeled "Comments on Statement of Reasons for Allowance."

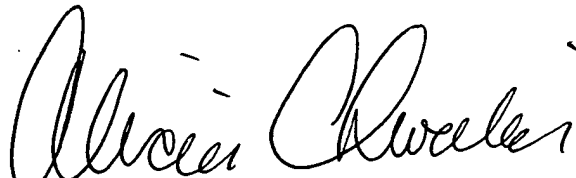
### ***Conclusion***

3. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Alicia Chevalier whose telephone number is (571) 272-1490. The examiner can normally be reached on Monday through Friday from 8:00 am to 4:00 pm.

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If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Harold Pyon, can be reached on (571) 272-1498. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



Alicia Chevalier

8/4/05



HAROLD PYON  
SUPERVISORY PATENT EXAMINER  
1772

8/5/05